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(REV. 1-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

4502-1001

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/019942

INTERNATIONAL APPLICATION NO.
PCT/NZ00/00115

INTERNATIONAL FILING DATE
29 June 2000

PRIORITY DATE CLAIMED
7 July 1999

TITLE OF INVENTION
FURNITURE

APPLICANT(S) FOR DO/EO/US
Danny MORRIS

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☒ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

International Preliminary Examination Report.
Application Data Sheet.
Search Report.
Abstract.

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
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17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,040. International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO 890. International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO 740. International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) 710. International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) 100. ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
				\$ 1,040	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 130	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	14 - 20 =	0	x \$ 18.	\$ 0	
Independent claims	3 - 3 =	0	x 84.	\$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 1,170	
Reduction of 1/2 for small entity				\$ 585	
SUBTOTAL =				\$ 585	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 585	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	
TOTAL FEES ENCLOSED =				\$ 585	
				Amount to be refunded:	\$
				charged:	\$

a. ☒ A check in the amount of \$ 585 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required by
 37 CFR 1.16 and 1.17, or credit any overpayment to Deposit Account No. 25-0120. A duplicate
 copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

January 7, 2002

SEND ALL CORRESPONDENCE TO:

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CUSTOMER NO. 000466

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 SIGNATURE

Benoit Castel

 NAME

35,041

 REGISTRATION NUMBER

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Danny MORRIS

Serial No. (unknown)

Filed herewith

FURNITURE

PRELIMINARY AMENDMENT

Commissioner for Patents

Washington, D.C. 20231

Sir:

Prior to calculation of the filing fee, please substitute Claims 1-43 as originally filed, which appear on pages 12-17, with Claims 1-14 as amended under Article 19. The pages containing claims 1-14 are attached hereto. Following the insertion of these claims, please amend as follows:

IN THE CLAIMS:

Amend claim 3 as follows:

--3. (amended) A support structure as claimed in claim 1 wherein the extendible side members and extendible end members are telescopically extendible.

Amend claim 5 as follows:

--5. (amended) A support structure as claimed in claim 1 wherein a plurality of support members are provided.

Amend claim 6 as follows:

--6. (amended) A support structure as claimed in claim 1 wherein the intersection of the ends of the side

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members and end members define corners where the legs are provided, and at least two of the corners have axial engagement means to engage with one or more corner posts which may extend away from the frame in a direction substantially perpendicular to the frame opposite the direction from which the legs extend.

Amend claim 8 as follows:

--8. (amended) A support member as claimed in claim 6 wherein the legs are adjustable in length.

R E M A R K S

The above changes in the claims merely place the national phase application in the same condition as it was during Chapter II of the international phase, with the multiple dependencies being removed.

Also, attached hereto is a marked-up version of the amended claims.

Respectfully submitted,

YOUNG & THOMPSON

By



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January 7, 2002

WO 01/03550**CLAIMS**

1 A support structure including

5 two substantially parallel extendable side members being capable of being disposed in an extended position or an unextended position and joined at their ends to the ends of two substantially parallel end members to thereby provide a dimensionally adjustable frame, and

10 an extendable support member, one end of the intermediate support member being slidably fixed to one of the side members and the other end of the support member being slidably attached to the other of the side members whereby the intermediate support members is provided substantially parallel to the end members and is movable relative to the side members without altering the degree of extension of the side members.

2 A support structure as claimed in claim 1 wherein the end members comprise extendable members which are capable of being disposed in an extended position or an unextended position.

15 3 A support structure as claimed in claims 1 or 2 wherein the extendible side members and extendible end members are telescopically extendible.

20 4 A support structure as claimed in claim 3 wherein each of the side members and end members is constructed of a formed material and each member comprises a number of separate tubular components which can slide relative to one another to thereby extend or retract the member in an axial direction.

5 A support structure as claimed in any one of the preceding claims wherein a plurality of support members are provided.

25 6 A support structure as claimed in any one of the preceding claims wherein the intersection of the ends of the side members and end members define corners where the legs are provided, and at least two of the corners have axial engagement means to engage with one or more corner posts which may extend away from the frame in a direction substantially perpendicular to the frame opposite the direction from which the legs extend.

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7 A support structure as claimed in claim 6 wherein the axial engagement means comprise a depression provided at the corner, depression being adapted to accommodate a frame engagement means of a longitudinal member

5 8 A support member as claimed in claim 6 or claim 7 wherein the legs are adjustable in length

9 A support structure including

10 two substantially parallel extendible side members being capable of being exposed in an extended position or an unextended position and joined at their ends to the ends of two substantially parallel extendible end members which are capable of being disposed in an extended position or an unextended position to thereby provide a dimensionally adjustable frame,

legs being provided extending from the frame to thereby support the frame in use,

the joined ends of the side members and end members defining corners, and

15 at least two of the corners having axial engagement means to engage with a longitudinal member which will in use extend substantially perpendicularly to the frame in a direction opposite the direction of the legs

20 10 A support structure as claimed in claim 9 wherein the longitudinal member comprises an end of a bed head, backrest or arm rest, and the longitudinal member has frame engagement means which is adapted to engage with the axial engagement means on the frame

11 A support structure as claimed in claim 9 wherein the longitudinal support member comprises a corner member of a bookcase or shelf unit.

12 A support structure as claimed in claim 9 wherein the legs are adjustable in length.

13 A support structure including

25 two substantially parallel extendible side members being capable of being exposed in an extended position or an unextended position and joined at their ends to the ends of two

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substantially parallel extendible end members which are capable of being disposed in an extended position or an unextended position to thereby provide a dimensionally adjustable frame,

- 5 a plurality of intermediate support members which are slidably fixed to the side members, the configuration and arrangement being such that the intermediate support members are adapted to slide along a part of the side members as the side members are extended or retracted to provide a substantially regular support structure to thereby evenly support an object placed on the support structure.

14 A support structure including

- 10 two substantially parallel extendible side members being capable of being exposed in an extended position or an unextended position and joined at their ends to the ends of two substantially parallel extendible end members which are capable of being disposed in an extended position or an unextended position to thereby provide a dimensionally adjustable frame,
- 15 and whereby the frame in the extended position is capable of covering greater than three times the area bounded by the frame when in the unextended position

MARKED-UP CHANGES MADE TO THE CLAIMS

3. A support structure as claimed in ~~claims 1 or 2~~
claim 1 wherein the extendible side members and extendible end
members are telescopically extendible.

5. A support structure as claimed in ~~any one of the~~
~~preceding claims~~ claim 1 wherein a plurality of support
members are provided.

6. A support structure as claimed in ~~any one of the~~
~~preceding claims~~ claim 1 wherein the intersection of the ends
of the side members and end members define corners where the
legs are provided, and at least two of the corners have axial
engagement means to engage with one or more corner posts which
may extend away from the frame in a direction substantially
perpendicular to the frame opposite the direction from which
the legs extend.

8. A support member as claimed in claim 6 ~~or claim~~
~~7~~ wherein the legs are adjustable in length.

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ABSTRACT OF THE DISCLOSURE

A furniture item includes at least a pair of members (2,3) defining a dimension in one direction of the item, the members of the pair being connected together by adjustable connecting elements (4), the arrangement and construction being such that the dimension in one direction can be adjusted by the adjustable connecting elements.

4/pat

Furniture

TECHNICAL FIELD OF THE INVENTION

This invention relates to adjustable furniture. For convenience only, the present invention will be described with reference to furniture such as beds for which the invention may be particularly applicable. However, it is to be understood that it is not to be limited as such. Moreover, because the invention may have other applications it is to be understood that the background art and possible embodiments of the invention as discussed below are given by way of example only.

10 BACKGROUND ART

Traditionally beds have been made to only a few specific sizes depending on requirements. For example, a cot for babies, a single bed for one person, or a double bed for two people, the double bed being either a large "king" size or a slightly smaller "queen" size.

Due to these set sizes, people are left with little choice of alternative sizes to suit their individual requirements. For example, it may be necessary to buy an adult size bed for a child's room where this size may not be required until several years later. Hence space in the room which may have more appropriate uses when the child is young, is unnecessarily taken up by the bed. Moreover in designing a bedroom the architect may be constrained by the fixed size of the bed so that it is difficult to optimise the design.

Furthermore, in the case where a cot is provided for a child, this may only be suitable for a short period of childhood, after which a larger bed must be bought. Not only does this involve extra costs but also a child may be reluctant to part with their bed. Folding beds and modular type

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beds (ie. beds where a base may be slid under the bed) do address some aspects of the problem with fixed sized beds in that a double size bed can be folded or stowed away so as to only take up the space of a single size bed. However, the bed size is still limited to a standard length and width so that the size of the bed cannot always be optimised.

- 5 Similar problems with obtaining optimum sizing of furniture to suit a room or to suit changing requirements may also arise with various other types of furniture such as couches, tables, bookcases and the like. These too, as with beds, are of fixed dimensions once assembled thus putting a constraint on the design of a room, and may with time become too large or too small for requirements. Moreover, they may be no longer required for their initial function, and
- 10 simply take up space.

Another problem with fixed sized furniture arises when installing the furniture in the room. Since the size is fixed it may be difficult or impossible to carry the furniture in its assembled form into the room due for example to narrow doorways, or staircases, thus making it difficult to install or rearrange such furniture.

- 15 Furthermore, items of furniture which are no longer required such as beds for occupants which have left take up space or must be stored. There is a need to be able to continue to use these items of furniture such as by converting them to other furniture, for example a bed could be converted into a dining table, a couch, a coffee table etc.

OBJECT

- 20 It is therefore an object of the present invention to provide various types of furniture which address the above problems or at least provide the public with a useful choice. It is another object of the present invention to provide furniture constructed so that the size thereof can be easily varied, to give a wide range of sizes to suit varying requirements, and which can also be converted to other items of furniture.

25 DISCLOSURE OF THE INVENTION

According to one aspect of the present invention there is provided a furniture item comprising: at least a pair of members defining a dimension in one direction of said item, the members of

said pair being connected together by adjustable connecting means, the arrangement and construction being such that said dimension in one direction can be adjusted by means of said adjustable connecting means.

5 According to another aspect of the present invention there is provided a furniture item substantially as described above further comprising at least a second pair of members defining a dimension in a second direction substantially perpendicular to said one direction. the members of said second pair being connected together by a second adjustable connecting means, the arrangement and construction being such that said dimension in said second direction can be adjusted by means of said second adjustable connecting means

10 The invention may be applicable to a variety of furniture items where it is desirable to be able to change the dimensions. For example. the furniture item may be a book case and the dimension in one direction may be a width or a height of the book case. Alternatively the furniture item may be a bed. with the dimension being a length or width of the bed.

The adjustable connecting means may involve any device or devices whereby the members may
15 be optionally located in a plurality of positions relative to each other. For example this may involve linkage means connected between members of the pair, the arrangement and construction being such that the members may be located relative to each other in a plurality of configurations

A suitable linkage arrangement may involve linkages such as found with folding beds. In this
20 case linkages may be arranged such that the width of the furniture item may be set to a range of widths, rather than the two widths provided by a conventional folding bed.

Alternatively or in addition the adjustable connecting means may involve a sliding element fixedly connected relative to one of the members, and slidably engaged with an element fixedly connected relative to another of the members, the arrangement and construction being such that
25 when the elements are slid relative to each other the members are constrained to move relative to each other along a substantially straight line.

In the case of such a sliding element fixedly connected relative to one of the members, this may be of any suitable section which may be engaged with a complementary surface formed on the other member. For example this may involve an angle or channel, which engages with a pin or pins on the other member, or a cylindrically shaped member which slides inside an aperture or tube formed on the other member.

The adjustable connecting means may also involve locking means for locking the elements or members relative to each other in a plurality of configurations. For example this may involve clamping means which depend on frictional forces between adjacent surfaces, or fastening devices which positively locate the elements or members relative to each other, or a combination of both.

The members may thus be fastened together at different relative locations to each other, enabling variation in the dimension or dimensions of the furniture item. The connecting means may also make use of other items in a room to provide location of the members relative to each other. For example, locational forces may be provided by frictional forces between item and the floor

Various types of fastening and clamping devices are possible. For example these may involve the use of pins or bolts which fit into apertures provided at a plurality of locations on the elements. A possible arrangement may be similar to that used for telescopic tripods or tent poles where a pin provided inside one tubular member is resiliently biased so as to spring out and engage in an aperture in the telescoping member. The fastening and clamping device may also involve threaded members which may be tightened to clamp contacting surfaces of the elements together

Friction members may also be provided to improve the locking effect. For example in the case of tubular members "O" rings may be used. In this case one possible arrangement may involve an "O" ring which is slidable along a tubular member which fits inside a larger diameter pipe having a flared inlet for accommodating the "O" ring, the arrangement being such that movement in one direction forces the "O" ring tight against the outer surface of the tubular member and the flared surface of the pipe thus preventing relative movement in that direction.

Alternatively a Crox nut type pipe coupling may be used with an "O" ring nipple, the "O" ring being clamped against the sliding surface with tightening of the coupling.

Members and elements of the furniture item may be made from a variety of materials as required or desired. In this respect the design and function of the adjustable connecting means may be chosen to suit the type of materials used. For example, in the case of a bed using metal or plastic tube for the frame, the connecting means may involve telescoping portions of the metal or plastic tube with metal or plastic tube type couplings. With a metal bed having for example angle or channel section structural members the connecting means may involve elongate slots formed in sections of the members, with threaded pins fixed to the mating members, and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions. In the case of a bed with wooden slats for the mattress support, the adjustable connecting means may involve flexible bands such as "O" rings which resiliently hold portions of the slats together while allowing limited relative movement therebetween in a lengthwise direction of the slats.

15 In the case of a wooden book case, the connecting means may involve elongate slots formed in sections on one structural member of the book case and threaded pins fixed to the mating portions on another structural member of the book case, and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions.

20 In the case of an adjustable bed, a mattress for the bed may be constructed so that the size thereof can be changed to suit the adjusted size of the bed. Suitable materials for the mattress may involve foam, air, water and more traditional materials. The mattress design may involve a modular construction so that sections may be added or removed as required. In this case a mattress cover may be provided which can accommodate the largest anticipated size, and portions of the cover can be folded under the mattress when the mattress size is reduced.

25 Sections of the mattress may be connected by any suitable means. For example in the case of a foam type mattress this may involve interlocking sections formed on the edges of the mattress sections. A suitable type of interlocking may involve for example, protruding and recess portions such as found on bubble packaging or sound proofing foam. An adjustable thick cover (eg. padded calico or thick cotton) may also be used to cover any additional sections, preventing

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slippage and any unevenness, thus giving the overall appearance and feel of a traditional mattress

In the case of water mattresses, a standard sectional water mattress can be utilised with additional compartments being filled, as and when required. Similarly with air mattresses the size can be adjusted by inflating additional compartments

As well as addressing the above problems encountered with fixed dimension type furniture, the present invention may also open up other aspects related to the uses of furniture which have not heretofore been considered. For example, a bed of variable dimensions may be made in the form of a house which could be extended to make a mansion, a bed representing a fort could be transformed into a castle, a bed in the form of a mini car could be transformed into one in the form of a stretch limousine. Additional accessories may also be added accordingly; for example book cases, writing desks etc. A bed in the form of a fort could have a drawbridge which becomes a desk.

According to a further aspect of the invention, there is provided a convertible furniture item including in combination, one or more tubular frame members adapted to be extensible in one or more directions, extensible post members adapted to be connected to and to support the frame members at various distances above floor level, the frame members further adapted to be connected to one or more conversion member adapted to convert one furniture item to a different furniture item, for example, a bed to a table, a dining table to a sofa or chair or a coffee table to a dining table.

Preferably the one or more frame members are adjustable by means of telescoping tubular members extensible to predetermined length intervals wherein they are held in position by one or more detent mechanisms.

Preferably the detent mechanisms are spring loaded pins located in an inner telescoping tube member adapted to engage a corresponding hole or slot in an outer telescoping tube member for holding the telescoping tubes at a predetermined length.

In the alternative, there are no detent mechanisms to hold the telescoping tubes in position but are held in position by the sheer weight of the frame member(s).

Preferably the conversion members include headboards, sideboards, interlocking slats or platform members adapted to convert one item of furniture into another.

- 5 Conveniently, the conversion members are also extensible adjustable to correspond to the extension adjustable to correspond to the extension of the frame member(s).

Preferably there are accessory fittings adapted to be detachably fitted to the frame members or conversion members, for example, a pivoting reading lamp, a writing table, a tray or a support for a television set, video recorder or personal computer, etc.

10 BRIEF DESCRIPTION OF THE DRAWINGS

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only and with reference to the accompanying drawings in which:

- Figure 1: is a schematic plan diagram of an adjustable bed according to an
15 embodiment of the present invention showing a plan view according to Example 1;
- Figure 2: is a side view of the bed of Fig. 1;
- Figures 3 and 3a: are enlarged views of a typical connecting device;
- Figure 4: is a head end view of the bed of Fig. 1; and
- 20 Figure 5: is a foot end view of the bed of Fig. 1.
- Figures 6, 7 and 8: are perspective view of the invention according to Example 2.

PREFERRED EMBODIMENT

Example 1

With reference to Figures 1 to 5, there is shown a furniture item according to Example 1 of the present invention in the form of a bed generally indicated by arrow 1. The bed 1 comprises a first pair of members defining a lengthwise direction, in the form of a bed head 2 and a bed foot 3. The bed head 2 and bed foot 3 are connected together by adjustable connecting devices generally indicated by arrow 4 provided on either side of the bed 1. As shown in detail in Fig. 3a, each of the connecting devices 4 comprise a portion of an outer tube 5 connected to the bed head 2 and a portion of an inner tube 6 connected to the bed foot 3. The diameters of the portions of the tubes 5, 6 are such that the tube 6 can slide freely inside tube 5 while being constrained thereby so as to move along its longitudinal axes.

The connecting devices 4 also comprise a locking coupling in the form of a Crox coupling generally indicated by arrow 7 having a nut portion 8 which is threaded onto a threaded portion 9 formed on the end of the tube 5, with an "O" ring 10 fitted inside the nut portion 8. The "O" ring 10 fits snugly around the tube 6 and is clamped tightly against the tube 6 when the nut 10 is tightened onto the thread 5, thereby locking the tube 6 relative to the tube 5.

With this arrangement the distance between the bed ends 2 and 3 may be adjusted to a required length, by sliding the pipe 6 inside the pipe 5. The bed ends 2, and 3 can then be locked in position relative to each other by tightening the coupling 7.

The bed is also provided with a number of cross members 11 and 12 to provide support for the mattress of the bed. The cross members 11 are fixedly connected at predetermined spacing to the pipe 5, while some or all of the cross members 12 may be slidably fitted to the pipe 6. This enables the spacing of the cross members 12 to be adjusted to suit the length of the bed 1.

To ensure a desired spacing of the cross members 12 with different degrees of extension of the bed 1, a suitable location device may be used. For example this may involve protrusions on the pipe 6 which locate the ends of the cross members 12 at the required spacing. Alternatively a flexible member may be tied between the cross members 12 so that as the bed 1 is increased in

length. the cross members 12 are separated from each other. while as the bed 1 is decreased in length the cross members 12 are able to lie closer to each other.

Although not shown in the drawings, additional leg supports may be provided if required at intermediate portions along the pipe member 5. These may be pivotally attached to the pipe
5 member 5 and folded down to give additional support when the bed is in an extended condition.

With the present embodiment the width of the bed 1 is also adjustable in a similar manner. As shown in Fig. 4 and Fig. 5, the bed head 2 and bed head 3 are each made up as two sections which are connected together by a second pair of adjustable connecting devices generally indicated by arrow 13 and 14. These connecting devices 13 and 14 are similar in design and
10 function to the connecting devices 7 except that the dimensions of the telescoping pipe sections may be different depending on the design and strength requirements. Moreover, the cross members 11 and 12 are formed with telescoping tubular sections 15 which can telescope inside each other as the width of the bed 1 is changed.

With such an arrangement the width of the bed as well as the length can be adjusted to suit
15 requirements.

For example the bed can be made smaller for transport or installation, and then expanded to a desired size once installed.

The bed can also be extended or widened to suit the size of a child as they grow, or can be easily adjusted at any time as may be required by children when playing. Moreover, the size of
20 the bed can be easily increased or decreased as required to suit individual requirements

Various types of mattress design may be used with the bed. For example a foam mattress of modular construction may be used, and sections may be added or removed as required. The mattress for the bed may be made of a modular construction so that separate modules may be connected or removed as required to suit the different sizes of the bed.

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Example 2

Figures 6, 7, 8 and 9 show a preferred embodiment of the invention according to Example 2 in the form of a bed 20 which can be converted to other items of furniture. The bed preferably has a frame 22 of powder coated steel tube. however other tubing such as aluminium, copper or plastic tube may be used. The tubular frame is extensible lengthwise and breathwise with sliding cross members 23, 25 which are spaced by lineage means in the form of a chain (not shown) and is supported by extensible post members 24 which can be screwed to the frame. The extensible post members allow the bed to be converted to a dining table or a coffee table and are major conversion members. The post members in some models, may be covered by a cosmetic member 26 into which the post member is inserted. Also shown is an adjustable headboard 28 which can be extended to accommodate different widths of the bed. The headboard has a projections 30, 32 or stumps which are insertable into sockets 34 in the frame. The bed has wooden slats 36, 38 which have complementary fitting tongue and groove edges 40 so that as the bed is lengthened, additional slats can be added end piece slats 36. The end piece slats have rubber plugs (not shown) which are insertable into sockets at the ends of the bed. The slats also provide the top of a dining or coffee table and can have a painted or polished finish surface. In the alternative to a slotted top, an integral top of metal or panel board or wood can be used (not shown). Accessory fittings in the form of pivoting support stands 42 for portable or television receivers or computer monitors can also be removably attached the frame.

20 ADVANTAGES

We believe the advantages of our invention to be as follows, however it should be appreciated that all such advantages may not be realised on all embodiments of the invention, and the following list is therefore given by way of example only as being indicative of potential advantages of the present invention. Furthermore, it is not intended that the advantages of the present invention be restricted to those of the list which follows.

1. The sizes of furniture items can be easily adjusted to suit requirements, thus extending the range of application of a particular type of item.
2. In the case of a bed, this can be easily changed in size to suit requirements.

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3 Items of furniture can easily be converted to other items of furniture according to changing needs.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the
5 spirit or scope as herein set forth in the claims.

Throughout the description and claims of this specification the word "comprise" and variations of that word, such as "comprises" and "comprising", are not intended to exclude other additives, components, integers or steps.

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CLAIMS

1. A furniture item comprising at least a pair of members defining a dimension in one direction of said item, the members of said pair being connected together by adjustable connecting means, the arrangement and construction being such that said dimension in one direction
5 can be adjusted by means of said adjustable connecting means.
2. A furniture item as claimed in claim 1 further comprising at least a second pair of members defining a dimension in a second direction substantially perpendicular to said one direction, the members of said second pair being connected together by a second adjustable connecting means, the arrangement and construction being such that said dimension in said second
10 direction can be adjusted by means of said second adjustable connecting means.
3. A furniture item as claimed in claim 1 or claim 2 wherein the adjustable connecting means is any device or devices whereby the members can be located in a plurality of positions relative to each other.
4. A furniture item as claimed in claim 3 wherein there are linkage means connected between
15 members of the pair, the arrangement and construction being such that the members can be located relative to each other in a plurality of configurations
5. A furniture item as claimed in claim 4 wherein the linkages can be arranged such that the width of the furniture can be set to a range of widths greater than two widths.
6. A furniture item as claimed in claim 4 or claim 5 wherein the linkages are claims
- 20 7. A furniture item as claimed in any one of the preceding claims wherein the adjustable connecting means includes a sliding element fixedly connected relative to one of the members, and slidably engaged with an element fixedly connected relative to another of the members, the arrangement and construction being such that when the elements are slid relative to each other, the members are constrained to move relative to each other along a
25 substantially straight line.

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8. A furniture item as claimed in claim 7 wherein the sliding element fixedly connected relative to one of the members is of any suitable section which can be engaged with a complementary surface formed on the other member.
- 9 A furniture item as claimed in claim 8 wherein the sliding element is an angle or channel,
5 which engages with a pin or pins on the other member.
- 10 A furniture item as claimed in claim 8 wherein the sliding element is a cylindrically shaped member which slides inside an aperture or tube formed on the other member
11. A furniture item as claimed in any one of the preceding claims wherein the adjustable connecting means also includes locking means for locking the elements or members relative
10 to each other in a plurality of configurations.
12. A furniture item as claimed in claim 11 wherein the locking means includes clamping means which depend on frictional forces between adjacent surfaces.
13. A furniture item as claimed in claim 11 wherein the locking means includes fastening devices which positively locate the elements or members relative to each other
- 15 14. A furniture item as claimed in any one of preceding claims wherein the members are fastened together at different locations relative to each other enabling variations in the dimension or dimensions of the furniture item.
- 20 15. A furniture item as claimed in any one of the preceding claims wherein the adjustable connecting means includes the use of other items in a room to provide location of the members relatively to each other.
16. A furniture item as claimed in any one of the preceding claims wherein the adjustable connecting means includes the use of locational forces provided by frictional forces between the furniture item and the floor.
- 25 17. A furniture item as claimed in any one of the preceding claims wherein the connecting means includes the use of pins or bolts which fit into apertures provided in a plurality of locations on the members or elements.

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18. A furniture item as claimed in any one of the preceding claims wherein the connecting means includes the use of telescoping tubular members wherein a pin provided inside one tubular member is resiliently biased so as to spring out and engage in an aperture in another tubular member
- 5 19. A furniture item as claimed in any one of the preceding claims wherein the connecting means includes the use of threaded members which may be tightened to clamp contacting surfaces of the elements or members together.
20. A furniture item as claimed in any one of the preceding claims wherein the connecting means includes the use of frictional "O" ring members to improve the locking effect.
- 10 21. A furniture item as claimed in claim 20 wherein the "O" ring is slidable along a tubular member which slides inside a larger diameter pipe having a flared inlet for accommodating the "O" ring, the arrangement being such that movement in one direction forces the O-ring tight against the outer surface of the tubular member and flared surface of the pipe thereby preventing relative movement in that direction.
- 15 22. A furniture item as claimed in claim 21 wherein the adjustable connecting means includes a Crox nut type coupling used with an "O" ring nipple, the "O" ring being clamped against the surface of the sliding tubular member on tightening of the coupling.
23. A furniture item as claimed in any one of the preceding claims constructed of metal or plastic tube.
- 20 24. A furniture item in the form of a bed with a frame constructed of metal or plastic tube and having adjustable connecting means involving telescoping portions of the metal or plastic tube with metal or plastic tube type couplings
- 25 25. A furniture item in the form of a bed having angle or channel section structural members, and adjustable connecting means including elongate slots formed in sections of the members with threaded pins fixed to mating members, and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions.

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- 26 A furniture item in the form of a bed with wooden slats for mattress support, having adjustable connecting means involving flexible bands such as "O" rings which resiliently hold portions of the slats together while allowing relatively movement therebetween in a length wise direction of the slats.
- 5 27 A furniture item in the form of a book case having connecting means involving elongate slots formed in sections on one structural member of the book case and threaded pins fixed to the mating portions on another structural member of the book case and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions
- 10 28 A furniture item in the form of a mattress for an adjustable bed which may be constructed so that the size thereof can be changed to suit the adjusted size of the bed, the mattress design involving a modular construction so that sections may be added or removed as required.
- 29 A mattress as claimed in claim 28 wherein a mattress cover is provided which can accommodate the largest anticipated size of the mattress, and portions of the cover can be folded under the mattress when size of the mattress is reduced.
- 15 30 A furniture item as claimed in claim 29 wherein the mattress is a foam type mattress having interlocking sections formed on the edges of the mattress sections.
31. A mattress as claimed in claim 30 wherein the interlocking sections are protruding and recessed portions which are adapted to interlock together.
- 20 32. A mattress as claimed in claims 29 or 30 wherein the mattress has an adjustable cover which is used to cover any additional sections of the mattress, preventing slippage and any unevenness, thereby giving the overall appearance and feel of a traditional mattress.
- 33 A mattress as claimed in claim 32 wherein the mattress is a water mattress with compartments which can be filled as required to increase the size of the mattress.
- 25 34. A mattress as claimed in claim 31 wherein mattress is an air mattress, the size of which can be adjusted by inflating additional compartments

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- 35 A convertible furniture item including in combination, one or more tubular frame members adapted to be extensible in one or more directions, extensible post members adapted to be connected to and to support the frame members at various distances above floor level, the frame members further adapted to be connected to one or more conversion members adapted to convert one furniture item to a different furniture item, for example, a bed to a table, a dining table to a sofa or chair or a coffee table to a dining table or any combination thereof
36. A convertible furniture item as claimed in claim 35 wherein the one or more frame members are adjustable by means of telescoping tubular members extensible to predetermined length intervals wherein they are held in position by one or more detent mechanisms.
- 37 A convertible furniture item as claimed in claim 36 wherein the detent mechanisms are spring loaded pins located in an inner telescoping tube member adapted to engage a corresponding hole or slot in an outer telescoping tube member for holding the telescoping tubes at a predetermined length.
38. A convertible furniture item as claimed in claim 36 wherein there are no detent mechanisms to hold the telescoping tubes in position but are held in position by the sheer weight of the frame member(s).
- 39 A convertible furniture item as claimed in any one of claims 36 to 38 wherein the conversion members include headboards, sideboards, interlocking slats or platform members adapted to convert one item of furniture into another.
40. A convertible furniture item as claimed in claim 39 wherein the conversion members are also extensibly adjustable to correspond to the extension of the frame member(s).
41. A convertible furniture item as claimed in any one of the preceding claims wherein there are accessory fittings adapted to be detachably fitted to the frame members or conversion members, for example, a pivoting reading lamp, a writing table, a tray or a support for a television set, video recorder or personal computer.
42. A furniture item substantially as herein described with reference to the accompanying illustrations.

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43. A convertible furniture item substantially as herein described with reference to the accompanying illustrations.

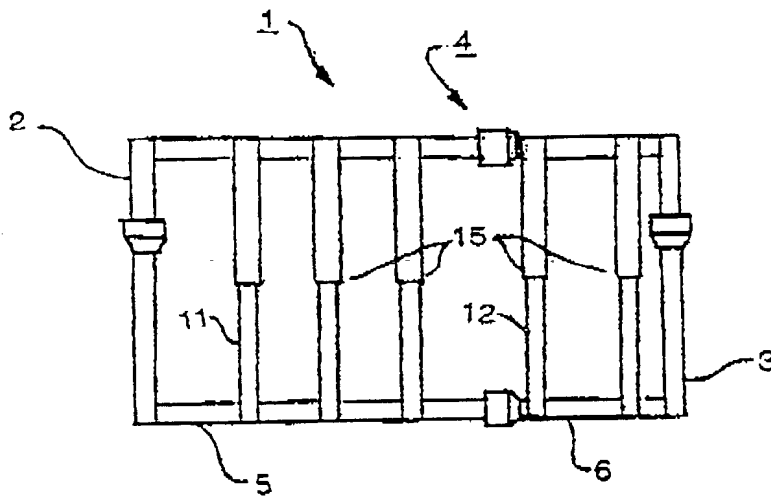


FIG. 1

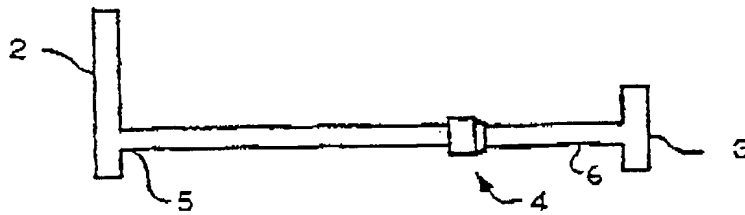


FIG. 2

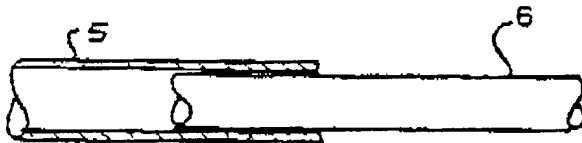


FIG. 3

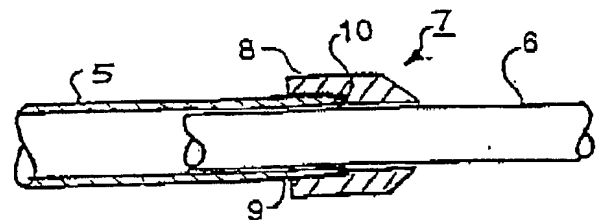


FIG. 3a

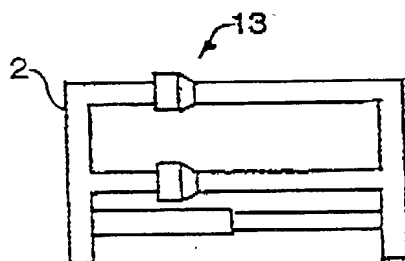


FIG. 4

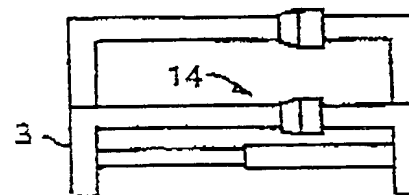


FIG. 5

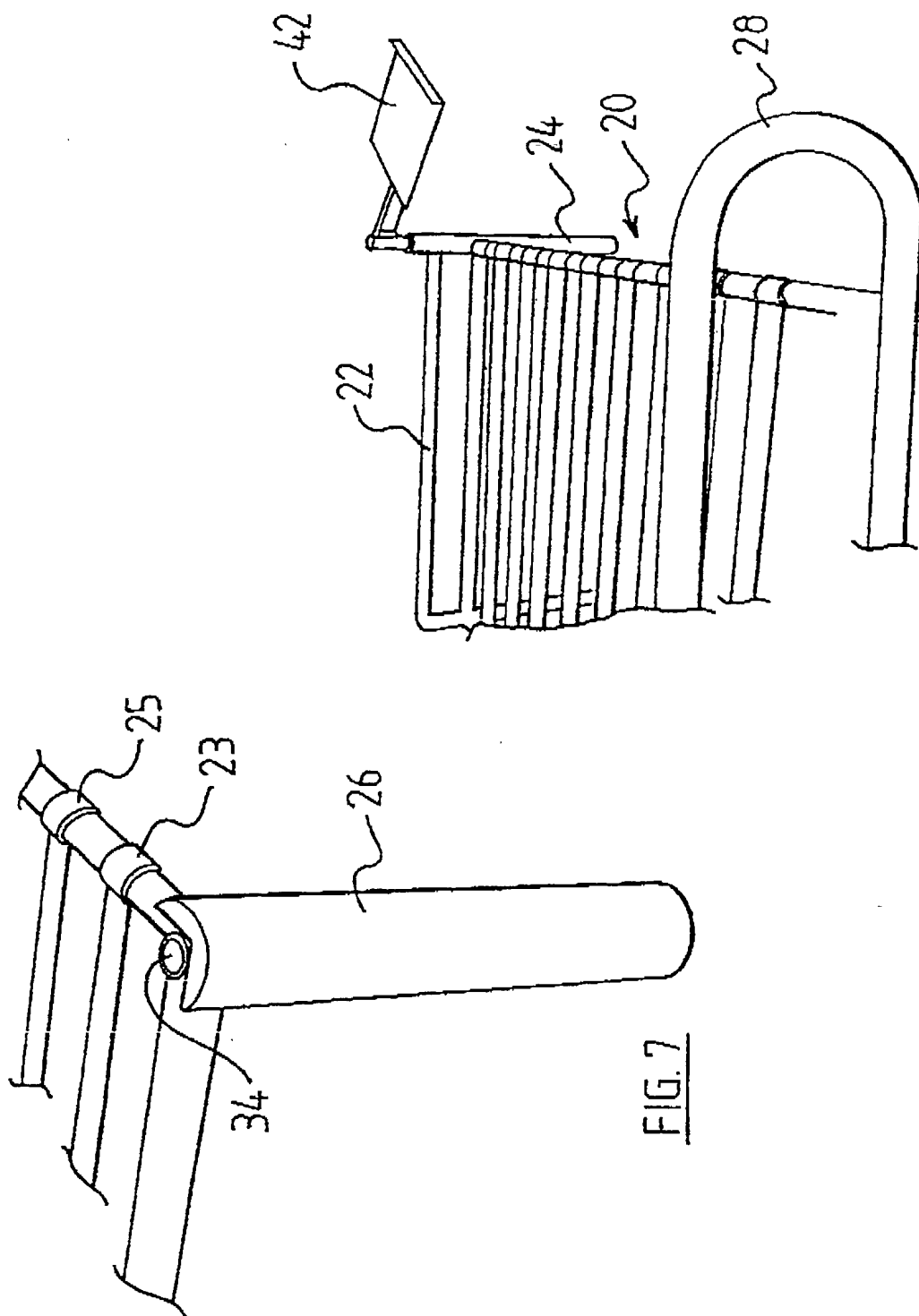


FIG. 6

FIG. 7

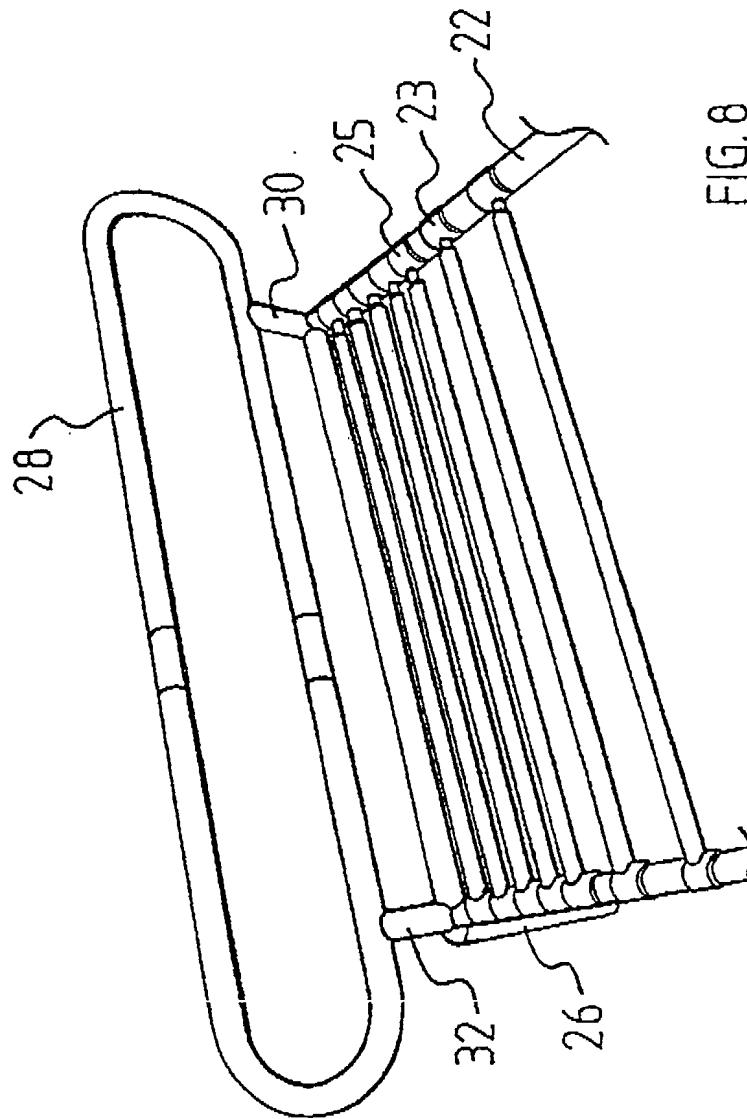


FIG. 8

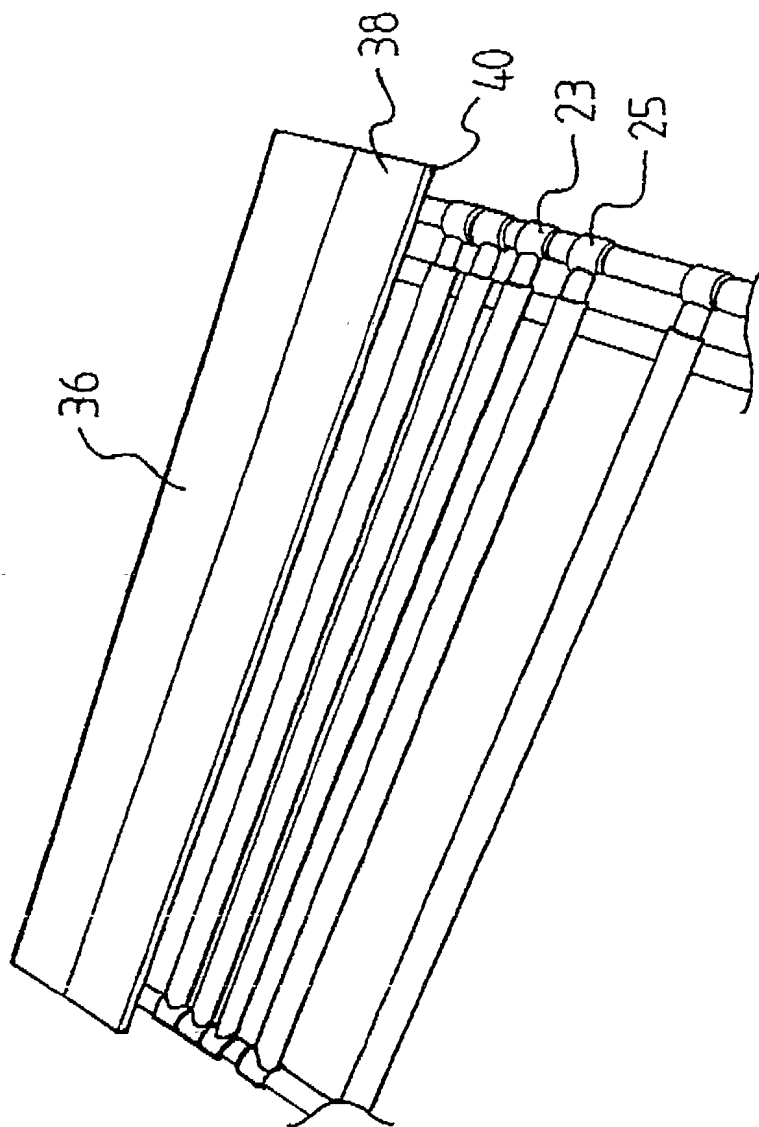


FIG. 9

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

FURNITURE

the specification of which: *(check one)*

REGULAR OR DESIGN APPLICATION

- ☐ is attached hereto.
- ☐ was filed on _____ as application Serial No. _____ and
was amended on (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

- ☒ was described and claimed in International application PCT/NZ00/00115 filed on
29 June 2000 and as amended on (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
New Zealand	336603	7 July 1999	yes

(Complete this part only if this is a continuing application.)

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

POWER OF ATTORNEY

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from **Pipers** as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the registered patent attorneys represented by Customer No. **000466** to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, including: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoît CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, Thomas W. PERKINS, Reg. No. 33,027, and Roland E. LONG, Jr., Reg. No. 41,949,**

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: **Danny MORRIS**
(given name, family name)

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Date 19/03/2002.

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